

**U.S. NAVAL BASE, PEARL HARBOR, AIRCRAFT CARRIER
BERTHING WHARF**

HAER No. HI-87

**(U.S. Naval Base, Pearl Harbor, Ford Island)
(Facility S382)**

**Northwest side of Ford Island, near Saratoga Boulevard
Pearl Harbor
Honolulu County
Hawaii**

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

**HISTORIC AMERICAN ENGINEERING RECORD
U.S Department of the Interior
National Park Service
Oakland, California**

HISTORIC AMERICAN ENGINEERING RECORD

U.S. NAVAL BASE, PEARL HARBOR, AIRCRAFT CARRIER BERTHING WHARF (U.S. Naval Base, Pearl Harbor, Ford Island) (Facility S382)

HAER No. HI-87

Location: Northwest side of Ford Island
Pearl Harbor Naval Base
City and County of Honolulu, Hawaii

UTM: The UTM coordinates for this facility are 04.607800.2363500.

Dates of Construction: 1943

Engineer/Builder: Contractors Pacific Naval Air Bases

Present Owner: United States Navy

Present Use: Berthing Wharf

Significance: Facility S382 is located within the Pearl Harbor National Historic Landmark. Constructed on the northwest side of Ford Island, it was part of a complex of buildings and berths that made up the main aircraft carrier support facilities in Hawaii during World War II. This complex provided support to aircraft carriers by preparing them for air battles and facilitating the rotation of planes. This readiness for Pacific battles contributed greatly to the final victory. Facility S382 is also significant as an example of the evolution of the types of berthing facilities built at Ford Island. The wharfs' foundation is two pairs of moorings that were built in the late 1930s for the berthing of battleships. The moorings were built upon and made into separate wharfs that were later joined. The original moorings were in use on the morning of December 7, 1941, and ships berthed there - the USS *Raleigh* at mooring F-12 and the USS *Utah* at F-13 - were attacked on that day.

Historian: Polly Cosson and George Casen, Architectural Historians, of Mason Architects, Inc.

Project Information: Photo documentation and recordation of this facility by the Navy has been done in anticipation of imminent repairs to concrete support piles, superstructure, bulkheads and mooring hardware of the facility. The timber fender system will be replaced by a fender system of foam-filled fenders supported by concrete bracing. Photo documentation of historic facilities by the Navy assists in expediting planned undertakings by having the documentation prepared prior to taking actions. Also, photo documentation assists the Navy in gaining more information about its historic facilities to assist in making proactive management decisions. This project is being supervised by Jeffrey Dodge, Historical Architect, NAVFAC Hawaii. The

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photographic documentation was undertaken by David Franzen, photographer. Polly Cosson and George Casen, Architectural Historians, of Mason Architects, Inc. prepared the written documentation. The field work and research was conducted for this report between March and May of 2005.

Description:

Facility S382 was constructed in three independent parts. Two pairs of irregularly shaped ship moorings designated as F-12 N (north), F-12 S (south), F-13 N (north), and F-13 S (south), constructed at this location circa 1937, form the facility's foundation. These moorings measured 21'-0" wide by 30'-3" long. They stand on a cylindrical base that is 12'-0" at the superstructure and 18'-0" at their base. Each has a center of concrete, with the remainder filled with sand. They sit upon a concrete bell at the ocean floor on a base 38'-0" wide and 4'-0" high that tapers up to the base of the supporting cylinder. Spud piles, which hold the moorings in place and secure it to the ocean floor, are imbedded into this base.

In 1943 the bitts (strong iron posts for working or fastening lines), the bollards to which mooring lines are secured, and the top 10" of surface concrete of the four moorings were removed. They were utilized to support two separate wharfs, which were given the same facility numbers as the moorings. A year later (1944) a connecting quay was built between the two wharfs F-12 and F-13. The completed three-part facility was given the designation Facility S382.

Facility S382, a complex of two wharfs with an interconnecting quay, has a continuous deck that measures 50'-0" in width. According to historic drawings, the total length measures 1380'-6 7/8". The south section F-12 is 451'-1" long, the north section F-13 is 452'-4 5/8" long, and the interconnecting quay is 477'-1 1/4" long. The deck is constructed of reinforced concrete. It rests upon girders and beams that are supported by 18" x 18" square composite piles that are beveled at the edges. A fender system sits along the outboard (ocean) side of the wharf. This is a series of 12" x 12" timber piles spaced 5'-0" center-to-center, bolted with 1" bolts to the concrete face of the quay. There are 8" x 12" chocks for securing vessels that run continuously between the timbers (a chock is a heavy fitting of metal or wood, through which a rope or cable may be run). Bitts, cleats and piping outlets are located along the outboard curb at various intervals.

The F-12 and F-13 sections that comprise parts of Facility S382 are structurally similar, although some slight differences exist such as the overall spacing between the supporting piles, the positioning of piles under the locations of the now-removed stationary cranes, the

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absence of curbs at the north and inboard edges of the F-13 deck, and the different designs at the points of land access.

In the F-12 and F-13 sections, batter (brace) piles that slope inward are placed at the outboard and inboard edges of the deck. These batter piles are between the straight piles located at the edges of each supporting bay.

In the F-12 section, the piles are set in a grid pattern, spaced 5'-6" center-to-center from inboard to outboard (width). The deck structure hangs 3'-0" beyond the centerline of the outermost pile. There are 45 bays measuring 10'-0" center-to-center along the length of this section. The deck is 10" thick. There is a facing of concrete along the outer edge of the deck. The piles in this section are constructed of concrete and extend to a level below the ocean floor. A 12" high and 24" wide curb follows the inboard (land side) of the wharf, which is closer to land. The outboard curb varies in width between 24" and 30". Supporting piles are placed only 3'-0" apart beneath where a stationary crane was located, approximately 45' and 65' southwest of the point of separation between the F-12 and interconnecting sections. Bents are transverse structural members used for strengthening the pier.

An access trestle is located perpendicular to the main wharf and connects it to land. This access wharf is 30'-0" wide. The 18" x 18" composite piers are spaced 6'-0" center-to-center. The deck structure here also hangs 3'-0" beyond the centerline of the outermost pile. There are 13 bays center-to-center along its length. This pier tapers from the two bays farthest from land (bents "J" through "L"), to meet seven bays on the inboard side of the main wharf (bents 26 through 33). The curbs are 12" x 12". An electric conduit from land runs below to the main wharf. This access wharf is connected to land by a steel pile bulkhead with 35' deep piles. The trestle also widens here to meet approximately 70' of the shoreline. There is a concrete cap at the top of the bulkhead that also acts as a curb. It measures 24" wide, 12" high, and 51' - 0" long."

The overall structural design of the F-13 section is similar to section F-12. The piles, however are spaced 8'-9 5/8" from inboard to outboard (width). The deck structure hangs 3'-3" beyond the outermost pile. Both concrete and composite concrete/timber 18" x 18" piles are used in this section. There are 45 bays measuring 10'-0" center-to-center along the length of this section. The deck is 10" thick. There is a 190'-0" concrete sheet pile wall, between approximately 40' and 120' northeast of the point of separation between the F-13 and interconnecting sections (bents 5 to 23), which adheres the wharf on the inboard side to a causeway on the adjacent land. In this portion of the F-13 section, the distance between the centerline of the concrete

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sheet pile wall and the centerline of the adjacent pile is 2'-9." The distance to the next pile is 8'-9 1/2." The remaining piles are spaced the standard 8' - 9 5/8" toward the outboard side of the wharf. The curb along the outboard side varies from a standard 12" wide to 3'-6" wide at the locations of paired bitts. No curbs are found at either the inboard edge, or at the end of the wharf. Additional piles are located approximately 50' and 70' southwest of the northeast end of this F-13 section (bents 39 through 41), where there previously existed a stationary crane. The piles were positioned directly beneath the crane's four corners. The crane has since been removed.

The central interconnecting quay is supported by the remnant portions of moorings F-12 North and F-13 South. This section has ten pile bays across the width, inboard to outboard. The four inner bays have piles spaced 5'-3" center-to-center. On each side of these is a bay measuring 3'-0." These are followed by two bays of 4'-3" on each side. There are 47 bays measuring 10'-0" long center-to-center along the length of this section. The deck structure hangs 3'-0" beyond the center of the outermost piles at both the inboard and outboard ends. The piles in this section are of composite and measure 18" x 18." The inboard curb of this section measures 12" wide and 10" high. The outboard curb varies from 2' wide to 3'-6" wide at the paired bitts. The bays that are spaced only 3'-0" along the length of the connecting quay are located beneath tracks where a traveling jib crane had once operated. This crane has since been removed. These tracks are spaced 24'-0" apart and are located 13'-0" from the outboard and inboard edges of the wharf. In this interconnecting quay section, the angled batter piles commence close to the center of the deck and slope outward.

Various alterations have occurred at Facility S382 since the structure was completed as one unit. For example, three cranes were removed from this facility. Refer to HAER No. HI-68-A, a crane overview report, for general information on cranes at Pearl Harbor. The floodlights that once existed on each of the three sections of Facility S382 have been replaced with a series of light poles. Electric conduits have been added along the underside of the inboard concrete face of the main wharf to supply these new lights with electricity. Since the events of September 11, 2001, the land access points to F-12 and F-13 have been secured by chain-link fencing, and security gates with a guardhouse have been built at F-13. Since this section was not designed with an inboard curb, safety concerns necessitated that timber curbing be added to the inboard side of the deck. An electrical substation has also been added along the inboard side of the deck of section F-13. The tracks of the traveling jib crane that once operated along the connecting quay have been in-filled with asphalt, and large concrete gate blocks have been added at each side of the inboard side of the point where the access pier of F-12

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connects to the main wharf. The fender assembly was removed from the inboard side of F-12 at an unknown date.

In 1959 floating mooring camels, which are movable fenders, were placed adjacent to F-12 and F-13. Constructed of 12" x 12" Douglas Fir timber, they are irregularly-shaped with overall dimensions of 100' – 0" long and 12' – 0" wide. Small movable boat landings, measuring 24' – 0" by 16' – 0", and built of 2" x 10" planks set on buoys, were added to F-12 in 1965. Both the mooring camels and small boat landings remain adjacent to the wharf.

This facility has become deteriorated and damaged through years of use and exposure to the marine environment. The concrete material of many of the supporting piers, longitudinal girders and transverse beams are in a state of deterioration. In the causeway area of section F-13, the concrete sheet pile bulkhead has developed large holes. The concrete curbing is spalling in many areas of the deck. There is extensive corrosion of the steel sheet pile bulkhead wall at the land base of the access trestle to section F-12 and the mooring hardware. The timber material of the fender assembly is in a state of disrepair with many missing fenders and broken supporting pieces.

Historical Context:

Although the Navy had acreage on Ford Island since 1902, the first military branch to build facilities there was the Army. In 1917 it built two batteries (Adair and Boyd) on the northwest side of the island as land defenses for Oahu's harbors and forts. Soon thereafter, the War Department determined that the island should be shared by the Army and Navy as an aviation installation. The Navy developed its land on the southeast side, in close proximity to the Pearl Harbor Navy Yard where it already had a temporary aviation base, and the Army constructed facilities on the northwest side. The center of the island was comprised of a joint-use landing field. In 1923 the Navy relocated its planes to Ford Island. The entire installation was known as Luke Field starting in 1919.

The Army and Navy shared Luke Field for roughly two decades. It became clear, however, that the installation's size could not accommodate the ever-expanding aviation arms of the Army and Navy; both were making rapid developments in airplane design and aviation technology and were in need of additional space. The Army began to relocate its personnel in the 1930s to Wheeler Field, and in 1939, it completed its departure from the island to the newly established Hickam Field. With the Army recently departed from the northwest side of the island in 1939, the Navy renamed the installation Naval Air Station Pearl Harbor.

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The Navy realized the need for ship moorings around the island in the mid-1930s. A circa 1936 Public Works of the Navy document summarizes the action it took:

The vital need for additional berthing space for capital ships at Pearl Harbor necessitated the development of 16 fixed moorings to relieve congestion at the existing pier. The moorings are of the interrupted quay wall type and are the first of this kind constructed. They provide berths similar to those at a pier at a greatly reduced cost. They economize on space and provide practically double the berthing for an equal area as compared to anchored moorings, and consequently effect a material savings in dredging required. The total cost of the project was \$540,000, of which the sum of \$39,863.45 was utilized for force account projects including the pay of administrative employees, the provision of bow and stern mooring floats, and for miscellaneous district work and materials.¹

The sixteen moorings formed pairs F-1 through F-8, located on Ford Island's southeast side and known as the famed "Battleship Row." Moorings numbered F-9 through F-13 were located on the northwest side of the island. A historic photograph dated 11 September 1936 shows completed moorings on the southeast side of the island, but none on the northwest side. They were constructed a few years later.

The moorings on the northwest side of the island could not be used by battleships immediately following their completion. An undated memo (c. 1939) from Ben Moreell, Chief of the Bureau of Yards and Docks, to the Chief of Naval Operations regarding Naval Activities at Pearl Harbor stated that, "There have recently been completed 10 battleship moorings [five pairs] on the north side of Ford Island but these can not at present be used for battleships because of the insufficiency of channel depth."²

Sometime around 1940 the Navy expanded Ford Island's shoreline with fill from various dredging and excavation projects. Some of the expansion occurred in front of mooring pairs F-12 and F-13. Mooring pairs F-12 and F-13 later became the actual foundations for wharf Facility S382 (discussion to follow). Most of the other mooring pairs at

¹ Public Works of the Navy, "FP 189. Fleet Moorings – Naval Operating Base, Pearl Harbor, Territory of Hawaii," ca. 1936.

² Moreell, Ben. Memo to the Chief of Naval Operations, n.d.

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Ford Island were also modified and had their facility numbers changed over time.

On December 7, 1941, the Japanese attacked not only the ships in the famous "Battleship Row" in the channel between the Navy Yard and the southeast side of Ford Island, but also the west side of Ford Island. On the morning of the attack, the seaplane tender *Tangier* was moored at F-10; the old target and training ship *Utah* was moored at F-11; and light cruisers *Raleigh* and *Detroit* were moored at F-12 and F-13, respectively. USS *Raleigh* was hit by one Japanese torpedo and one bomb and nearly sunk. USS *Utah* was less fortunate. She received two torpedoes, which completely overwhelmed her and caused her to capsize in minutes. About sixty crew members were trapped within the ship and died. Others were able to abandon ship, but were faced with gunfire from the air as they swam back to Ford Island's shore.

USS *Raleigh* underwent major repairs after the attack and was returned to active service within the fleet roughly six months after December 7th. A commemorative tablet was erected onshore in memory of the event. It reads "On the morning of 7 December 1941, the USS *Raleigh*, moored at berth Fox 12 sustained damage on the portside from an aerial torpedo. She was also hit by one fifteen inch projectile type bomb which passed through several decks and out the portside exploding in the water. The *Raleigh* did not sink."

The USS *Utah* was turned upright in 1943-44 to clear the channel, but was not raised or salvaged. In a confidential letter, Chester W. Nimitz had directed that:

Because the cost in time, labor, and material which would be incurred in raising the *Utah* were all problematical, and inasmuch as the submerged, righted *Utah* would not offer serious impairment to carrier berthing facilities F-9, F-10, F-12 and F-13, [should] she be left submerged when righted, and that steps be taken to build pier extensions as necessary.³

The USS *Utah*'s remains, which are partly above water to the southwest of Facility S382, are the site of a small memorial. A plaque reads, "In memory, Officers and Men, USS *Utah*, Lost in Action, December 1941".

³ Pacific Bridge Company, *Technical Report and Project History Contract NOy-5049, for Construction of Dry Dock and Power Plant, Moorings and Additional Facilities at Navy Yard, Pearl Harbor, T.H. 1944*, p. 99.

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After the attack, during the early part of the war, "the moorings on the northwest side on Ford Island were the preferred berthing spaces for the aircraft carriers when they came to Pearl Harbor on the way to or between battles."⁴ As the war progressed, additional development occurred throughout Naval Air Station Pearl Harbor, including expanded facilities for aircraft carrier berths. The existing moorings were used as foundations for new wharfs, to facilitate carrier access and the loading and unloading of equipment and planes. Contractors Pacific Naval Air Bases (CPNAB), a consortium of builders responsible for the majority of construction at Pearl Harbor during the early years of the war, completed this work. CPNAB referred to the new wharfs as the "T wharfs" because of their "T" shape.⁵

Historic maps show that the first pair in the row of moorings on the northwest side of Ford Island to be converted into a wharf was mooring pair F-9. This occurred sometime prior to June of 1942. Another historic map indicates that by October of 1943, mooring pair F-10 had also been converted into a wharf, and the conversion of mooring pairs F-12 and F-13 was underway. The map also shows that additional fill was being added at F-13, and instead of being converted into a "T wharf" like the others, the bottom of the "T" shape was instead widened into a large bulkhead.

Below is an excerpt from a memo dated June 22, 1944, that documents the third installment costs for converting mooring pairs F-12 and F-13 into wharfs.⁶ The costs indicate that a crane tower was added to wharf F-12 at this time. The memo indicates that the contract for this work (NOy-4173) actually fell within another contract number (NOy-8511).

Completion of NOy-4173 project CP15 (3rd installment)
as follows:

Carrier mooring F-13

1. Fill (\$65,000)
2. Paving (\$22,000)
3. Services (\$15,000)

Carrier mooring F-12

1. Fill (\$90,000)
2. Paving (\$15,000)

⁴ Yoklavich, Ann, Historic American Buildings Survey, U.S. Naval Base, Pearl Harbor, Aircraft Carrier Support Facilities, HABS No. HI-394, 2004, p. 1.

⁵ Contractors Pacific Naval Air Bases, *Technical Report and Project History, Contracts NOy-3550 and NOy-4173*, n.d., p. A-587.

⁶ Weeber, C.F., Memo for All Concerned, dated June 22, 1944, regarding Contract NOy-8511.

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3. Services (including crane tower - \$35,000)

Total Cost: \$245,000

According to an unnumbered January 1, 1946 historic map, the only indication of a crane on any part of F-12/F-13 was one located at wharf F-13. However, historic drawings indicate that three cranes were built. (Information on the traveling jib crane is provided on an October 6, 1944 drawing numbered 311838. The fixed crane on wharf F-12 is shown on October 4, 1943 drawings numbered V-N15-177 and V-N15-178. The fixed crane on wharf F-13 is shown on a September 11, 1943 drawing numbered 249384 and a September 8, 1943 drawing numbered V-N15-170).

An historic drawing dated October 6, 1944 indicates that an approximately 477' long connecting quay, or interconnecting wharf, was built to connect wharfs F-12 and F-13 at this time. A record report for this cost plus-a-fixed fee contract, which shows the Hawaiian Dredging Company as the contractor, states that the reinforced concrete superstructure of mooring platforms F-12 (North) and F-13 (South) was removed first, as well as the concrete girder walls, cleats, bollards, etc., and that subsequently reinforced concrete girders were constructed over the remaining cylinders.

The October 6, 1944 drawing also shows that crane rails were added to span the length of the connecting quay, becoming the site for the wharf's new portal crane. The record report states that the Bureau of Aeronautics (BuAer) furnished a Clyde Whirley No. 3407 model, 30-ton crane for this location. The completion of the interconnecting wharf, and the assembly and testing of the crane, were accomplished between 21 September 1944 and 30 April 1945.

Maps show that although they became one unit with the new connecting quay, the wharfs retained their separate facility numbers. By 1953, however, the wharfs were referred to on Navy maps with two names; F-12 was also called Facility S382, and F-13 was also called Facility S381. A 1982 map shows that by this time, while they still retained their old mooring numbers, the whole unit was renamed Facility S382.

The portal crane was removed sometime shortly after August 1979. It is not known when the fixed cranes were removed.

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For a history and overview of carrier support facilities at Pearl Harbor see HABS No. HI-394. For an overview on Pearl Harbor's waterfront facilities see HABS No. HI-53.

Sources:

Original drawings are on digitally scanned images or microfilm at Naval Facilities Pacific (NAVFAC PAC) Plan Files. These included drawings numbered 123822 thru -3; 124001, 249272 thru -8; 249293 thru -4; 249384; 249465; 311838 thru -9; 731924; 7475; 7490; 7860; 834346 thru -7; 848; 884533 thru -5; B-N2-343; V-N15-168; V-N15-176 thru -88; V-N1-211 thru -12; V-N1-215; 1084148 thru -9; 1230036; 16048 thru -9; and 311840.

Crane photos provided by Jeffrey Dodge, Historical Architect, NAVFAC Hawaii.

Bureau of Yards and Docks. *Building the Navy's Bases in World War II, Vol. I and II*, 1946. U.S. Government Printing Office.

Contractors Pacific Naval Air Bases. *Technical Report and Project History, Contracts NOy-3550 and NOy-4173*, n.d. Microfilm of report at library of Naval Facilities Engineering Command, Pacific.

Commander, Navy Region Hawaii. *Pearl Harbor Naval Complex, Cultural Resources Management Plan, Pearl Harbor, HI*, 2000.

_____. *Integrated Cultural Resources Management Plan, Pearl Harbor Naval Complex, Pearl Harbor, HI*, 2002.

Moreell, Ben. Memo to the Chief of Naval Operations, n.d. In files of Port Hueneme NAVFAC Archives, declassified 27 September 1958, Pearl Harbor (General) folder.

National Archives, Still Photo Collection.

Naval Historical Center. *Pearl Harbor Raid, 7 December 1941—Attacks off the West Side of Ford Island*, n.d. Accessed at www.history.navy.mil/photos/events/wwii-pac/pearlhbr/ph-west.htm on April 26, 2005.

Pacific Bridge Company for Navy Department, Bureau of yards and Docks. *Technical Report and Project History Contract NOy-5049, for Construction of Dry Dock and Power Plant, Moorings and Additional Facilities at Navy Yard, Pearl Harbor, T.H.* 1944. Document in PAC Div Library microfiche VA 69.5 J2.

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Public Works of the Navy. Document title unknown - page 79, c.
1936. Subheading reads "FP 189. Fleet Moorings – Naval
Operating Base, Pearl Harbor, Territory of Hawaii". Copied at
Port Hueneme NAVFAC Archives, from "Pearl Harbor
Development 1935-1936" folder.

Woodbury, David O. *Builders For Battle, How The Pacific Naval Air
Bases Were Constructed*. New York: E.P. Dutton and
Company, 1946.

Weeber, C.F. Memo for All Concerned, dated June 22, 1944,
regarding Contract NOy-8511. In Walter F. Dillingham Papers,
Box 33-7 at Bishop Museum Archives.

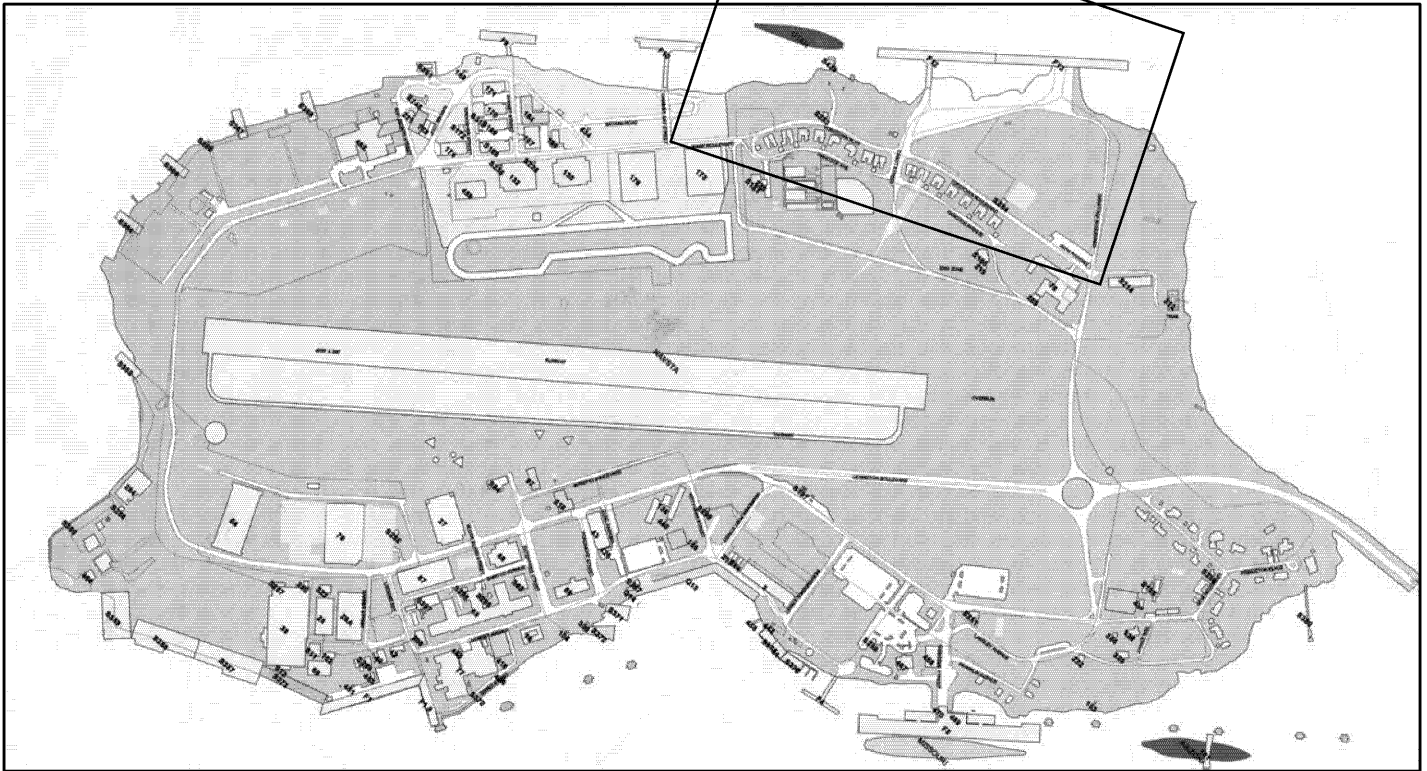
Yoklavich, Ann. Historic American Buildings Survey, U.S. Naval
Base, Pearl Harbor, Aircraft Carrier Support Facilities, HABS No.
HI-394, 2004.

_____. Historic American Engineering Record, U.S. Naval Base,
Pearl Harbor, Waterfront Facilities, HAER No. HI-53, April 2005.

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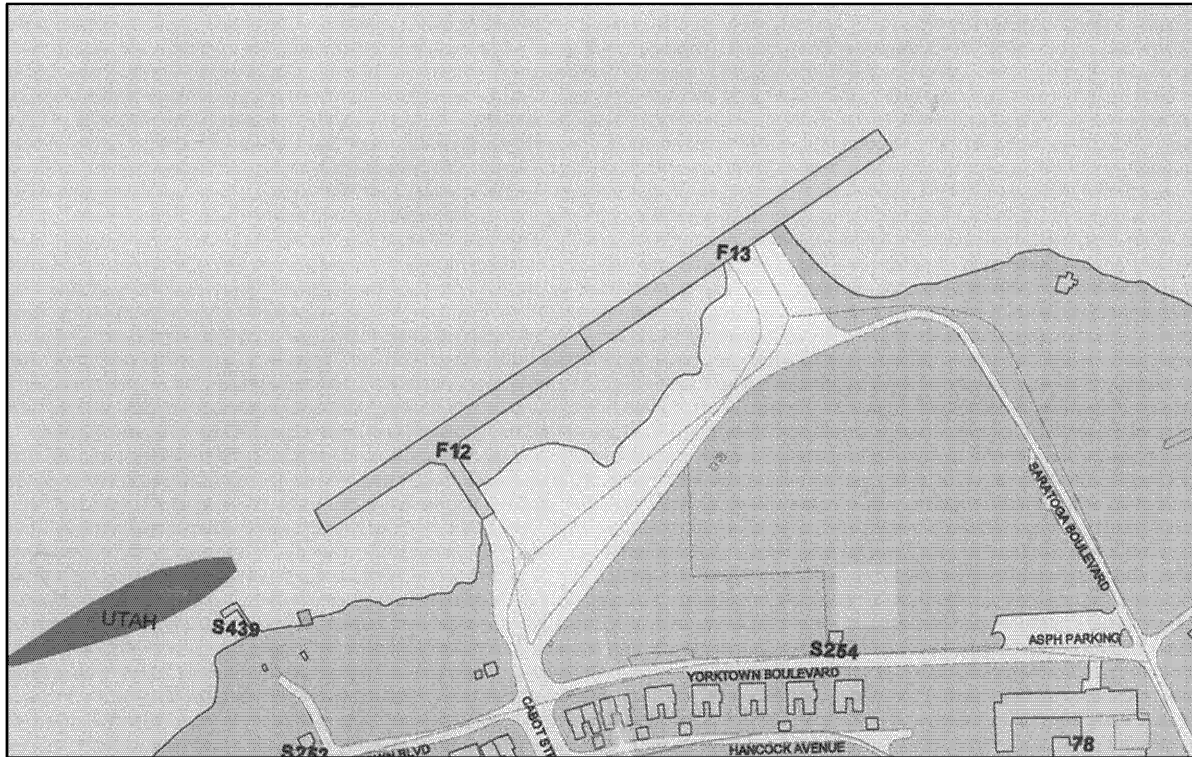
Ford Island Map

See enlarged area map



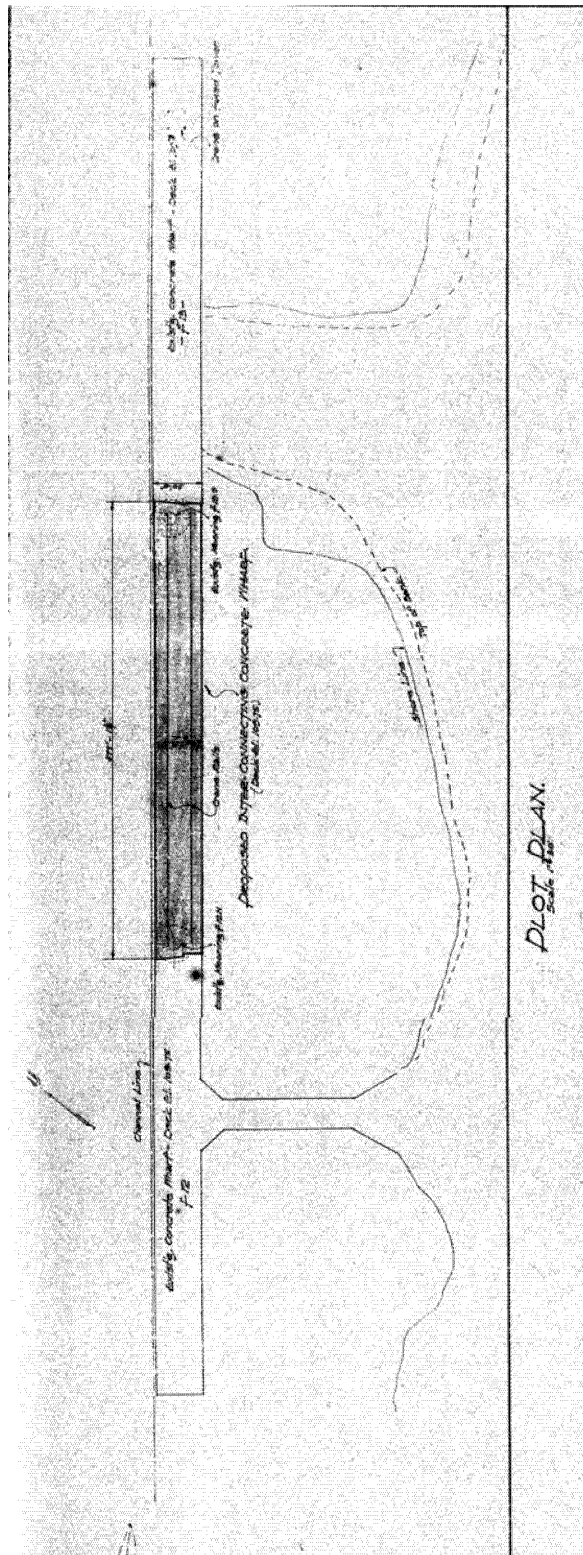
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Enlarged Area Map



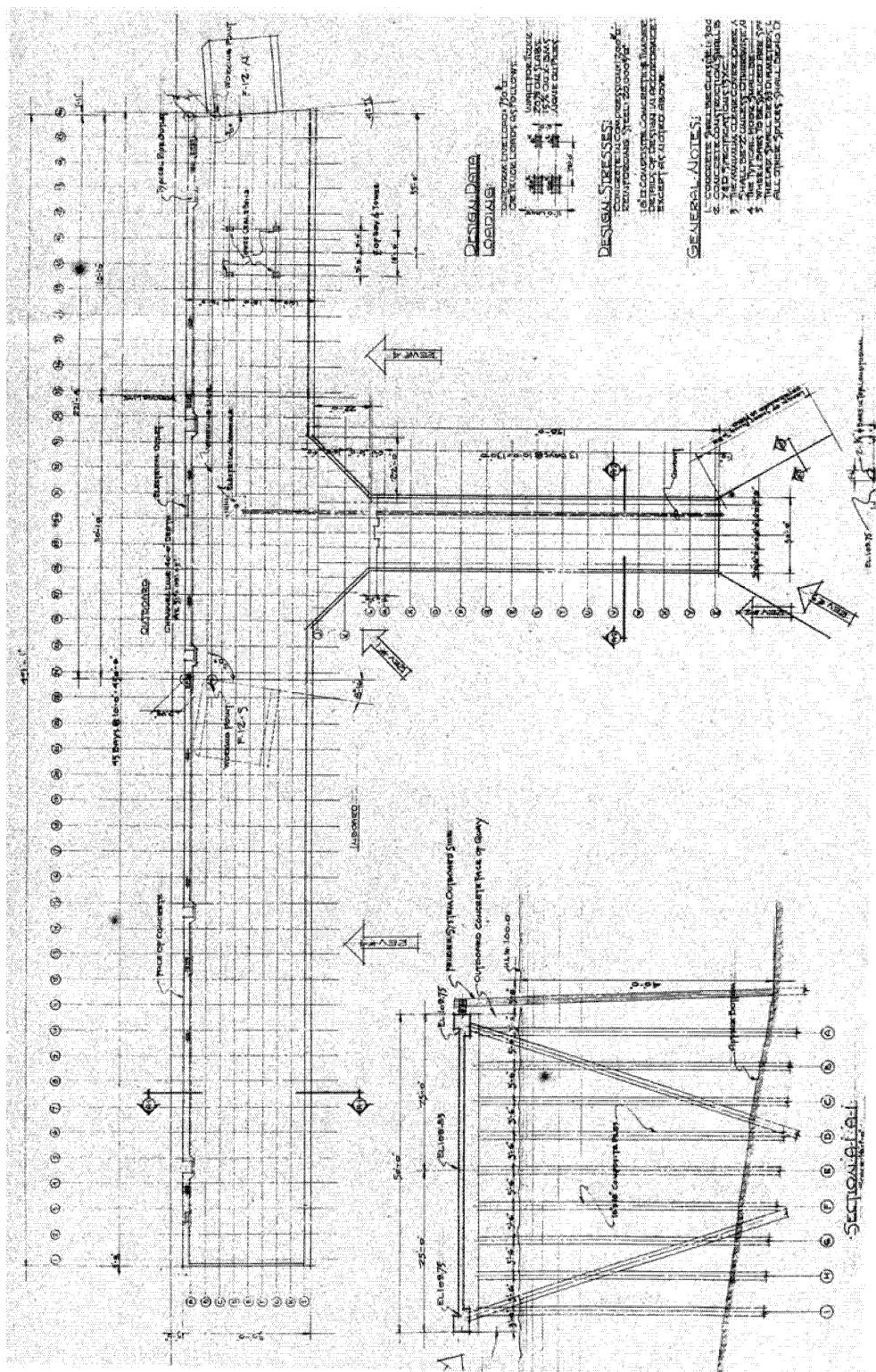
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Plot Plan showing Connecting Wharf F-12 & F-13
 (Portion of Drawing No. 311838, dated Oct. 6, 1944) (reduced, not to scale)

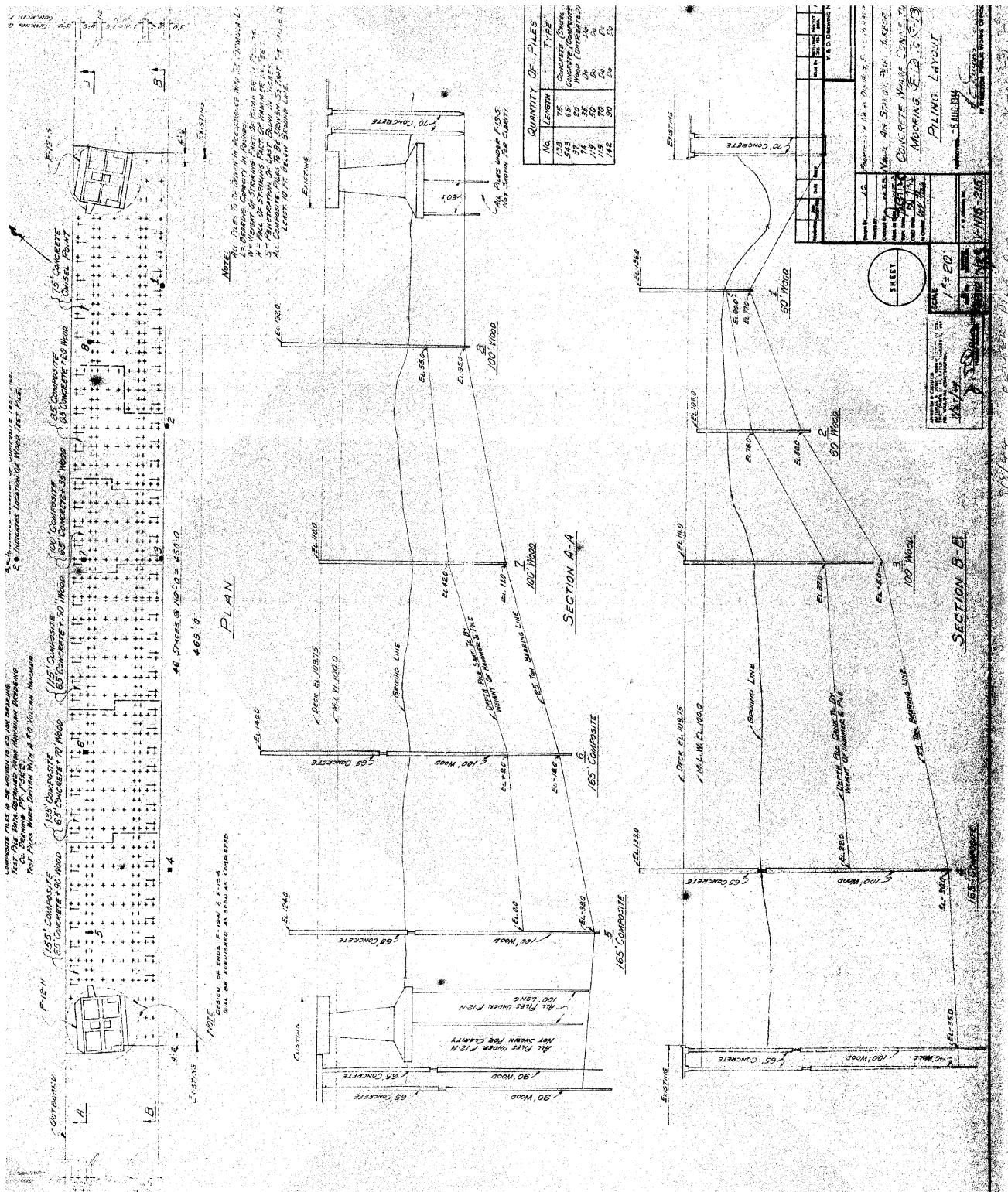


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(Drawing No. V-N15-177, dated Oct. 4, 1943) (reduced, not to scale)

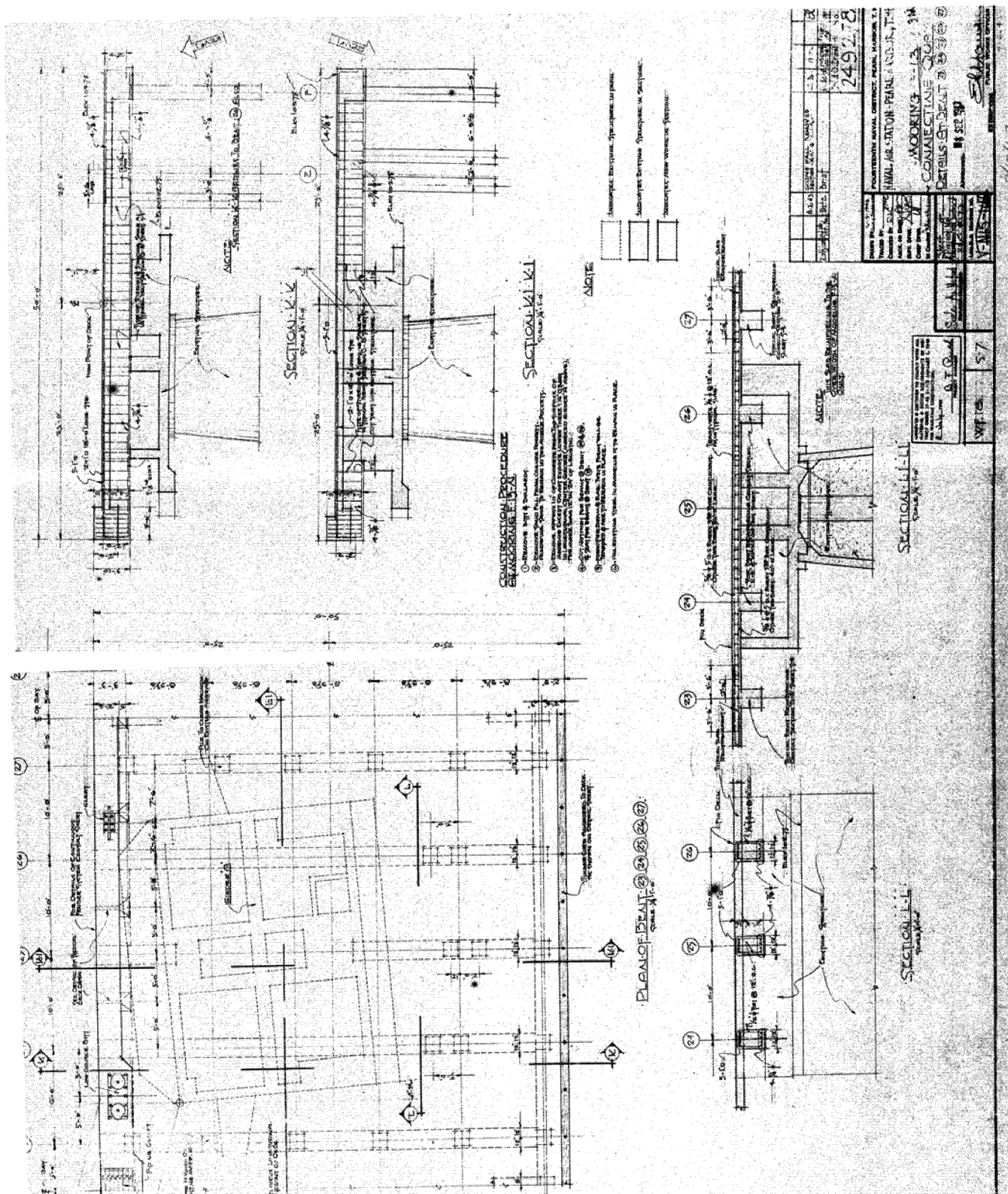


**Concrete Wharf Connecting Mooring F-12 to F-13 – Piling Plan
(Drawing No. V-N15-215, dated Aug. 8, 1944) (reduced, not to scale)**



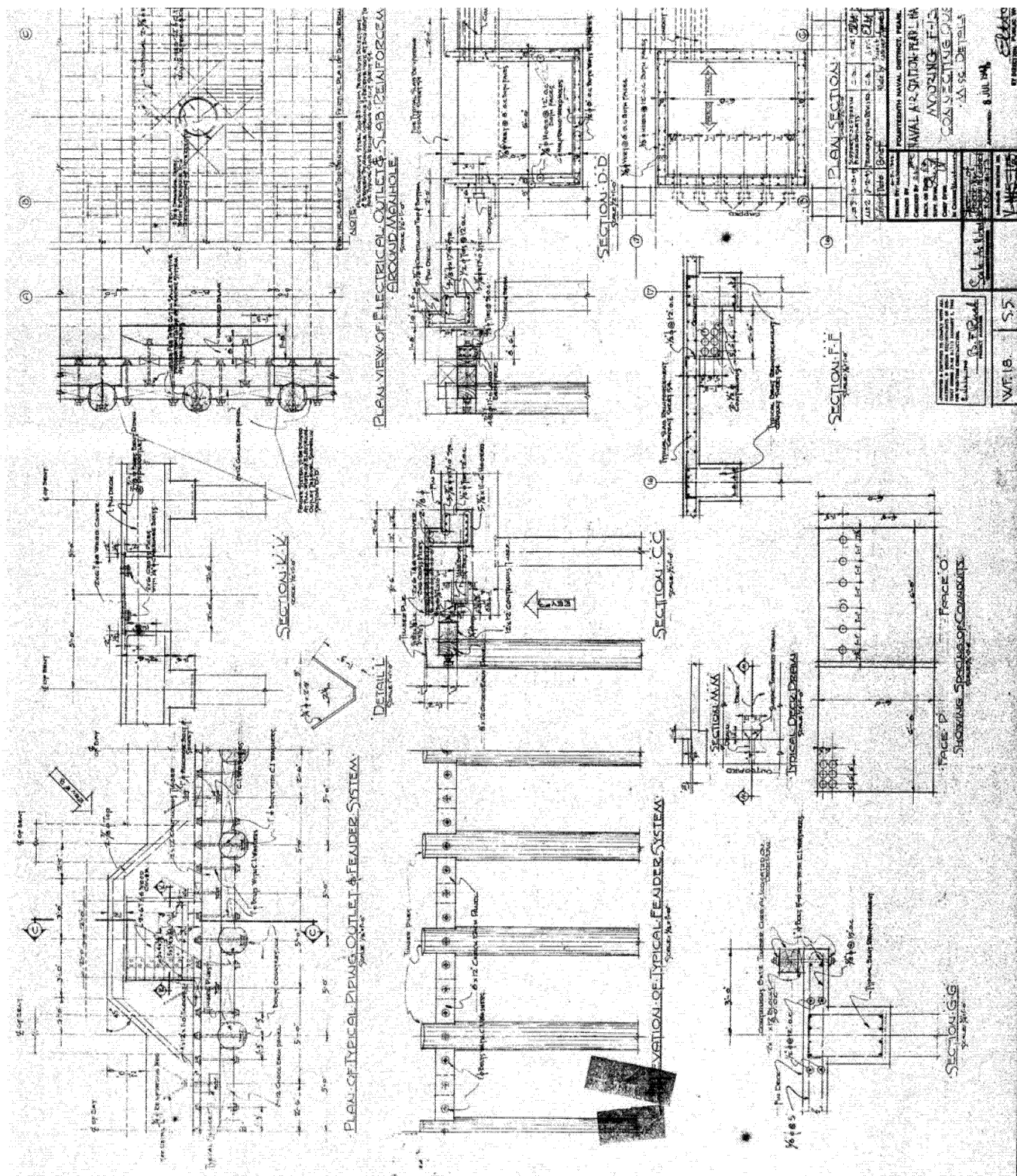
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Mooring F-13 Connecting Quay, Details at Bent
(Drawing No. 249278, dated Aug. 17, 1943) (reduced, not to scale)



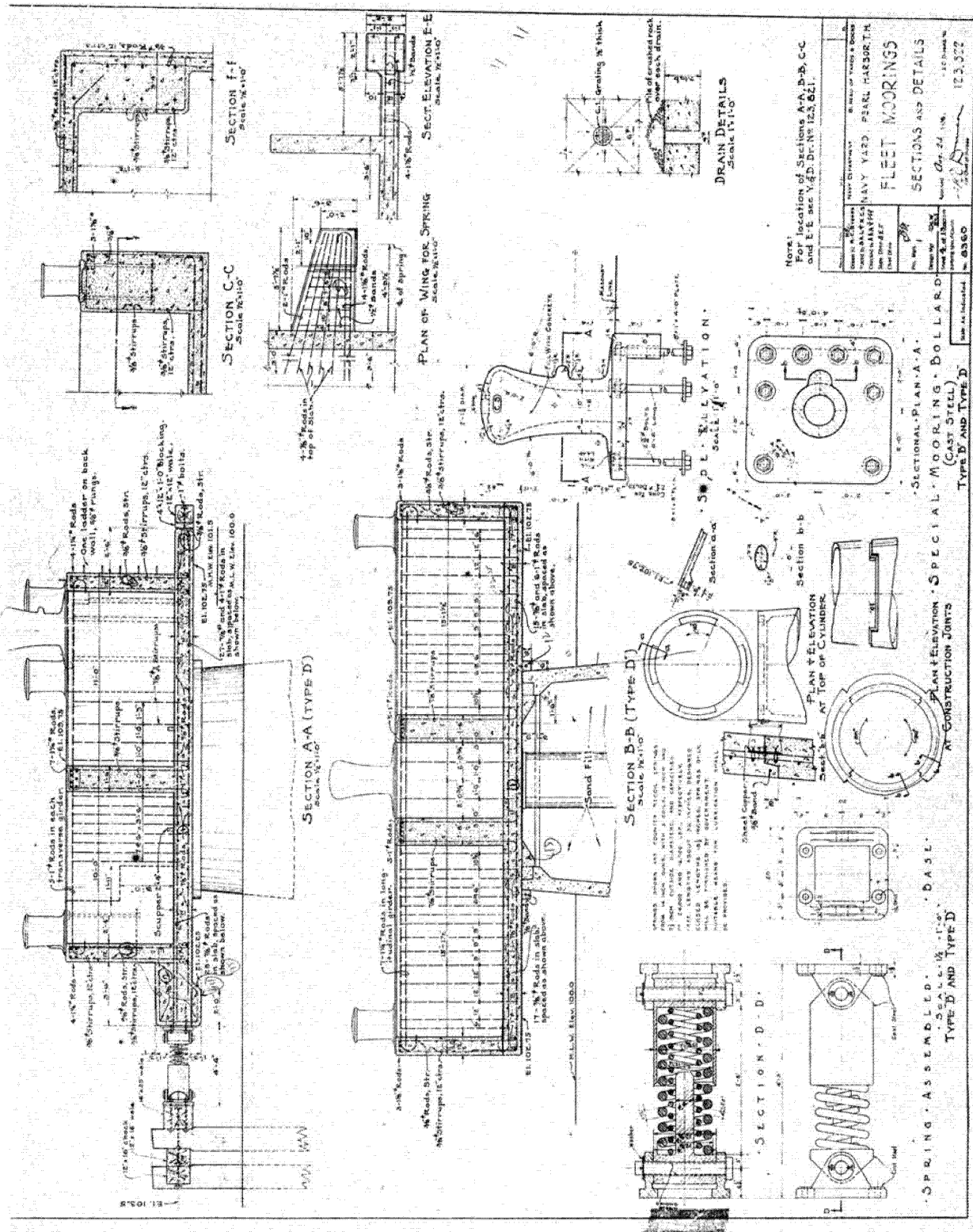
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Mooring F-13 Connecting Quay Miscellaneous Details
(Drawing No. 249276, dated Aug. 17, 1943) (reduced, not to scale)



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Fleet Moorings, Sections and Details
(Drawing No. 123822, dated Aug. 24, 1936) (reduced, not to scale)

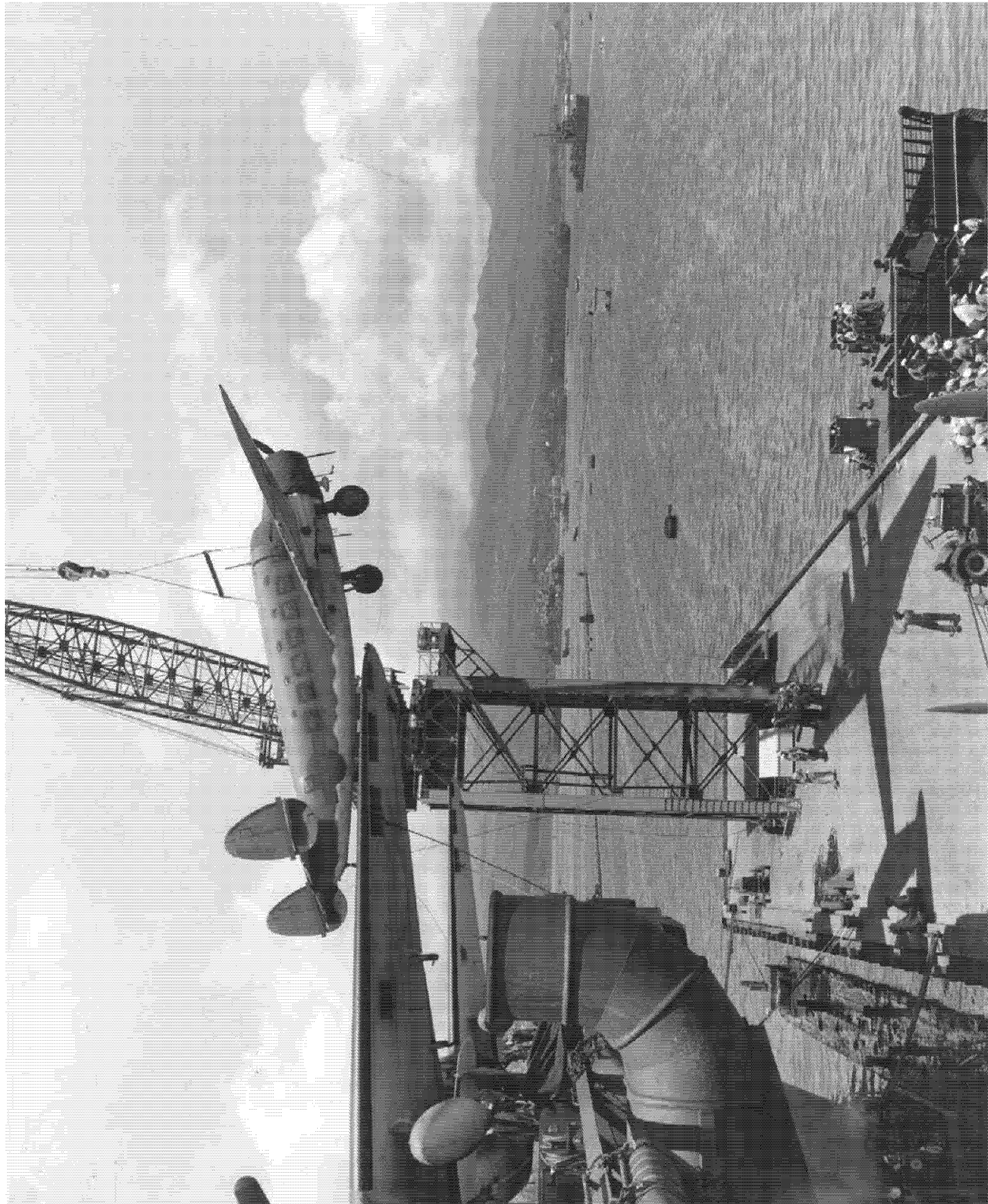


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**Aircraft being unloaded from aircraft carrier at wharf F-13 on Ford Island April 18, 1944.
Navy Department Photo No. 80-G-263379 in the National Archives.**



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**View of Portal Crane atop Facility S382 (Wharfs F-12 and F-13)
Photo dated October 1978**



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Close up view of Portal Crane at Facility S382 (Wharfs F-12 and F-13)
Photo dated October 1978

